

RADIO STATION WIBS
10 KW DA-1 740 KC
SANTURCE, PUERTO RICO

MODIFICATION OF DA
APRIL 28, 1950

GLENN D. GILLET & ASSOCIATES

Broadcast Application		FEDERAL COMMUNICATIONS COMMISSION		Section V-A		
STANDARD BROADCAST ENGINEERING DATA		Name of applicant Jose E. del Valle				
<p>1. Purpose of authorization applied for: (Indicate by check mark)</p> <p>(If application is for a new station or for any of the changes numbered B through F, complete all paragraphs of this form; if change G is of a character which will change coverage or increase the overall height of the antenna structure more than 15 feet, answer all paragraphs, otherwise complete only paragraphs 2 and 3 and the appropriate other paragraphs; for changes H through M, complete only paragraph 2 and the appropriate other paragraphs; for change N complete only paragraphs 2 and 13.)</p> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>A. <input type="checkbox"/> Construct a new station</p> <p>B. <input type="checkbox"/> Change power</p> <p>C. <input type="checkbox"/> Change transmitter location</p> <p>D. <input type="checkbox"/> Change frequency</p> <p>E. <input type="checkbox"/> Approval of site and antenna</p> <p>F. <input type="checkbox"/> Special Service Authorization</p> <p>G. <input checked="" type="checkbox"/> Change in antenna system (including addition of FM and TV antennas)</p> </td> <td style="width: 50%; vertical-align: top;"> <p>H. <input type="checkbox"/> Change frequency control equipment</p> <p>I. <input type="checkbox"/> Change tubes in last radio stage</p> <p>J. <input type="checkbox"/> Change system of modulation</p> <p>K. <input type="checkbox"/> Change transmitter</p> <p>L. <input type="checkbox"/> Install auxiliary or alternate main transmitter</p> <p>M. <input type="checkbox"/> Other changes (specify)</p> <p>N. <input type="checkbox"/> Change studio location</p> </td> </tr> </table> <p>If this application is not for a new station, summarize briefly the nature of the changes proposed.</p> <p style="text-align: center;">Change directive antenna system to conform with conditions of grant of CP</p>					<p>A. <input type="checkbox"/> Construct a new station</p> <p>B. <input type="checkbox"/> Change power</p> <p>C. <input type="checkbox"/> Change transmitter location</p> <p>D. <input type="checkbox"/> Change frequency</p> <p>E. <input type="checkbox"/> Approval of site and antenna</p> <p>F. <input type="checkbox"/> Special Service Authorization</p> <p>G. <input checked="" type="checkbox"/> Change in antenna system (including addition of FM and TV antennas)</p>	<p>H. <input type="checkbox"/> Change frequency control equipment</p> <p>I. <input type="checkbox"/> Change tubes in last radio stage</p> <p>J. <input type="checkbox"/> Change system of modulation</p> <p>K. <input type="checkbox"/> Change transmitter</p> <p>L. <input type="checkbox"/> Install auxiliary or alternate main transmitter</p> <p>M. <input type="checkbox"/> Other changes (specify)</p> <p>N. <input type="checkbox"/> Change studio location</p>
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2. Facilities requested		4. Transmitter				
Frequency 740 kc	Power in kilowatts Night 10 kw Day 10 kw	Make no change	Type No.	Rated Power		
Hours of operation		(If the above transmitter is composite or a type not having received approval by the F.C.C., attach as Exhibit No. a complete showing of transmitter details in accordance with Sections 12, 13, and 14 of the Standards of Good Engineering Practice for Standard Broadcast Stations. Showing should include schematic diagram and full details of frequency control. If changes are to be made in licensed transmitter include schematic diagram and give full details of change.)				
<p>Unlimited <input checked="" type="checkbox"/> Sharing with (specify stations)</p> <p>Daytime only <input type="checkbox"/> Other (specify)</p> <p>Limited <input type="checkbox"/></p>						
3. Antenna system, including ground or counterpoise		5. Modulation monitor				
<p>Non-Directional Antenna: <input type="checkbox"/> Directional Antenna: <input type="checkbox"/></p> <p>Day <input type="checkbox"/> Day only (DA-D) <input type="checkbox"/></p> <p>Night <input type="checkbox"/> Night only (DA-N) <input type="checkbox"/></p> <p>Same constants and power day and night (DA-1) <input checked="" type="checkbox"/></p> <p>Different constants or power day and night (DA-2) <input type="checkbox"/></p>		<p>Make no change Type No.</p>				
<p>(If a directional antenna is proposed submit complete engineering data. Show clearly whether directional operation is for day or night or both. If day and night patterns are different give full information on each pattern. This information is in addition to the information in Paragraph 3 and is submitted as Exhibit No. 1 and signed by the engineer who designed the antenna system.) See Engineering Affidavit</p> <p>Height in feet of complete radiator above base insulator, or above base if grounded 300' & 450'</p> <p>If antenna is either top loaded or sectionalized describe fully as Exhibit No. 1 Engr. aff.</p>		6. Frequency monitor				
Describe method of exciting antenna series		<p>Make no change Type No.</p>				
<p>If shunt excited give:</p> <p>Length of slant wire feed in feet _____</p> <p>Height of connection to tower above earth in feet _____</p> <p>Distance from coupling apparatus to tower in feet _____</p> <p>If unconventional feed, describe fully as Exhibit No. _____</p>		7. Attach as Exhibit No. 1 map or maps having reasonable scales clearly showing the following: no change				
<p>If the antenna system is not fully described above, give further details and dimensions including information on high frequency antennas mounted on the towers, as well as on the associated isolation circuits as Exhibit No. N.A. (See Sections 3 and 5 of the Standards of Good Engineering Practice Concerning Standard Broadcast Stations.)</p> <p>Submit as Exhibit No. 1 a plat of the transmitter site showing boundary lines, and roads, railroads, or other obstructions; and also layout of the ground system or counterpoise. Show number and dimensions of ground radials or if a counterpoise is used, show height and dimensions.</p>		<p>(a) Proposed antenna location</p> <p>(b) General character of the city or metropolitan district, particularly the retail business, wholesale business, manufacturing, residential, and unpopulated areas (by symbols, cross-hatching, colored crayons, or other means)</p> <p>(c) Heights of buildings or other structures and terrain elevations in the vicinity of the antenna, indicating the location thereof</p> <p>(d) Transmitter location and call letters of all radio stations (except amateur) and the location of established commercial and government receiving stations within 2 miles of the proposed transmitter location. Call letters and locations of broadcast stations, including FM and television, within 5 miles must be shown.</p> <p>(e) Terrain and types of soil</p>				
		8. Attach as Exhibit No. _____ a sufficient number of aerial photographs taken in clear weather at appropriate altitudes and angles to permit identification of all structures in the vicinity. The photographs must be marked so as to show compass directions, exact boundary lines of the proposed site, and locations of the proposed 250 and 500 mv/m contours for both day and night operation. Photographs taken in eight different directions from an elevated position on the ground will be acceptable in lieu of the aerial photographs if the data referred to can be clearly shown. ON FILE				
9. Attach as Exhibit No. 1 map or maps (same map or maps supplied for Paragraph 7 may be used) having reasonable scales showing the following: (NOTE: See Standards of Good Engineering Practice Concerning Standard Broadcast Stations and where involved, metropolitan districts according to the latest Census of the Commerce Department shall be outlined on the maps.)						
<p>(a) The 500, 250, 25, 5 and 2 mv/m contours, both existing and as proposed by the application for both day and night operation. (NOTE: The 2 mv/m nighttime contour need not be supplied if service is not rendered thereto.);</p>						

9. (Continued)

- (b) The normally protected contours of the station both existing and as proposed by the application for both day and night operation. When the application includes 1 kilowatt nighttime operation on a regional channel both the 2.5 and 4.0 mv/m contours should be supplied;
- (c) The interference-free contours of the station both existing and as proposed by the application, for both day and night operation (including nighttime computed RSS for a Class IV station) if the station would be limited inside its normally protected contours by any other station or stations;

- (d) The present normally protected and interference-free contours for both day and night operation of each station to which objectionable interference will be caused (without regard to this interference from the station as proposed by the application);
- (e) The resulting interference-free contours of the stations in (d) above, considering the interference from the operation of the station as proposed by the application.

10. Attach as Exhibit No. 1 a statement describing in detail the methods employed in determining the contours required in Paragraph 9 above (including conductivities, basis therefor and how used, effective fields and how obtained, interference fields, and other pertinent data).

11. Areas and populations

(NOTE: See the Standards of Good Engineering Practice Concerning Standard Broadcast Stations. All towns and cities having populations in excess of those given in Table II of Section I of the Standards of Good Engineering Practice are not to be included in the tabulation of populations within the service contours. The 1940 or later Census Minor Civil Division maps are to be used in making population counts, subtracting any towns or cities not receiving adequate service, and where contours cut a minor division assuming a uniform distribution of population within the division, to determine the population included in the contours unless a more accurate count is made.) Attach as Exhibit No. 1 tables of the areas and populations within the contours included in Paragraph 9 above. When applicable, include that area and population within the metropolitan district encompassed by the 2 mv/m daytime and interference-free nighttime contours.)

12. Attach as Exhibit No. 1 a statement giving the basis for the above areas and populations.

13. Proposed location of main studio

State	County
Puerto Rico	
City or town	Street and number
Santurce	

14. Proposed transmitter location

State	County	City
Puerto Rico		Bayamon
Number and street (or other indication of location)		
Route 24 & Bayamon Municipal Limits		

I certify that I am the Technical Director, Chief Engineer or Consulting Engineer for the applicant of the radio station for which this application is submitted and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief. (This signature may be omitted provided the engineer's original signed report of the data from which the information contained herein has been obtained is attached hereto.)


TECHNICAL DIRECTOR, CHIEF ENGINEER or Consulting Engineer

Date April 25, 1950

**Affidavit of W. E. Plummer Concerning
the Application of Jose E. del Valle at
Santurce, Puerto Rico to Make Changes
in the Directive Antenna System of
Radio Station WIBS**

The affiant, W. E. Plummer, is a consulting radio engineer with offices in Washington, D. C. and is a member of the firm of Glenn D. Gillett & Associates. This firm has been retained by Senor Jose E. del Valle to design a directive antenna to reduce the radiation toward Havana, Cuba to 260 mv/m as well as to afford the necessary protection to existing stations for use by Radio Station WIBS with 10 kw DA-1 on 740 kc at its new site.

A new site and directive antenna for use by WIBS was proposed by application File No. BP 7390, engineering affidavit dated October 7, 1949 to comply with the U. S. Navy's request that WIBS move its station. This application was granted subject to reducing the radiation in the direction of CMCD Havana to 260 mv/m. This reduction has been accomplished by a minor change in the parameters of the antenna system and by rotating the axis of the towers 5° counterclockwise.

The resultant radiation pattern and other pertinent information are attached. No other changes are proposed.

April 28, 1950


W. E. Plummer

DISTRICT OF COLUMBIA) SS.

W. E. Plummer, being first duly sworn on his oath, deposes and says that he is the above named affiant

and that the facts stated in the foregoing affidavit and all exhibits attached thereto are true of his own knowledge except as to such statements as are therein stated on information and belief and as to such statements he believes them to be true.

W. E. Plummer
W. E. Plummer

Subscribed and sworn to before me this 28th
day of April, 1950.

Patricia D. Linton
Notary Public

My commission expires April 14, 1951

**RADIO STATION WIBS
10 KW DA-1 740 KC
SANTURCE, PUERTO RICO**

**LIST OF APPENDICES
APRIL 28, 1950**

1. Description of antenna system
2. Tower location and ground system
3. Horizontal radiation pattern
4. Vertical radiation patterns
5. Map showing location of site and pertinent contours
6. Map showing location of pertinent contours
7. Basis for location of contours
8. Population and area data
9. Basis for area and population
10. Horizontal radiation pattern data
11. Vertical radiation patterns data
12. Interference data, Form 97307 B

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DESCRIPTION OF ANTENNA SYSTEM

A. Number of Elements:

Day - N = 3

Night - N = 3

B. Type of Each Element:

Guyed, insulated, constant cross-section towers

C. Loading:

Tower No. 1 - top loaded by guys to 180°

Tower No. 2 and 3 - none

D. Height of Vertical Lead Above Insulators:

Tower No. 1 = 450' loaded to 180°

Tower No. 2 = 300' or 86°

Tower No. 3 = 300' or 86°

E. Height Overall: (above ground level)

Tower No. 1 = 455'

Tower No. 2 = 305'

Tower No. 3 = 305'

F. Height Overall Above Mean Sea Level:

Site = 30'

Tower No. 1 = 485'

Tower No. 2 = 335'

Tower No. 3 = 335'

G. Orientation of Array (referred to Tower No. 1):

Tower No. 1 = θ_1 = reference

Tower No. 2 = θ_2 = 350

Tower No. 3 = θ_3 = 200

H. Phasing of Elements:

Tower No. 1: Zero or reference time phase

Tower No. 2: ψ_2 = 76° (lead)

H. Phasing of Elements: (continued)Tower No. 3: $\psi_3 = -130$ (lag)**I. Spacing of Elements:**

$$s_2 = 120^\circ 443'' \quad s_3 = 120^\circ 443'$$

$$\phi_{23} = 310^\circ$$

J. Ground System:

120 radials 330 feet long, equally spaced about each tower and buried approximately six inches. A 64 foot expanded copper mesh ground screen will be used under the center tower and a 48 foot expanded copper mesh ground screen will be used under each of the end towers.

K. Element Fields:

$$\text{Day} \quad E_1 = 1.0 \quad E_2 = 0.5 \quad E_3 = 0.35$$

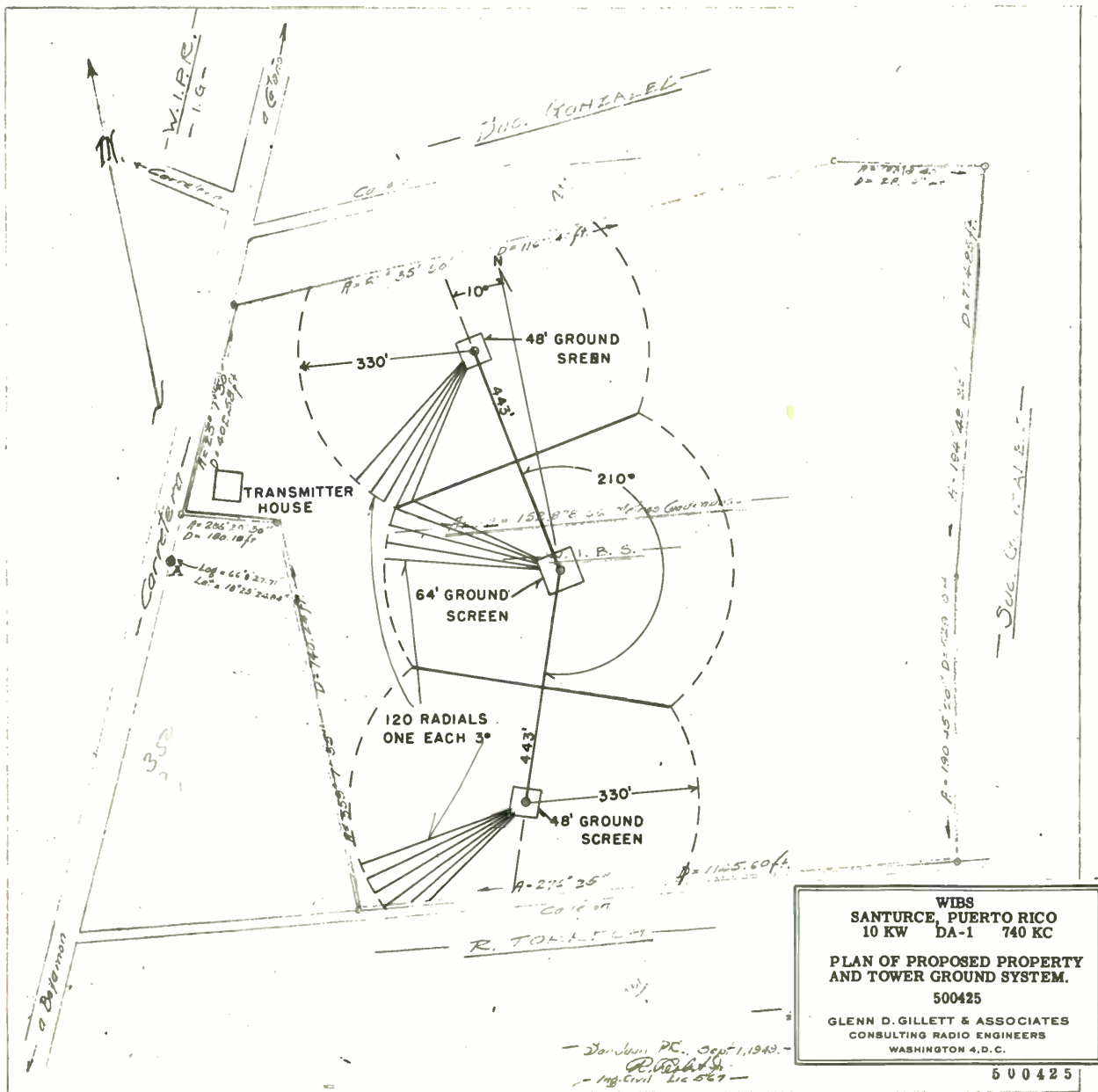
$$\text{Night} \quad E_1 = 1.0 \quad E_2 = 0.5 \quad E_3 = 0.35$$

L. Computed RMS Field:

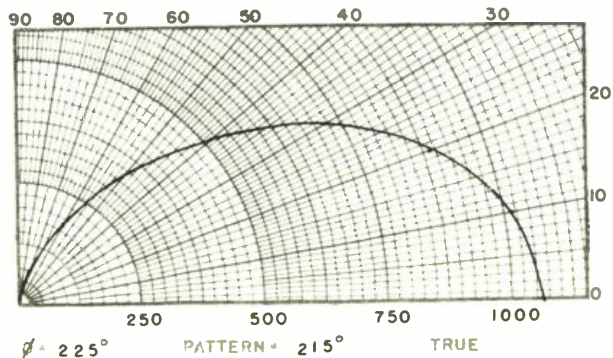
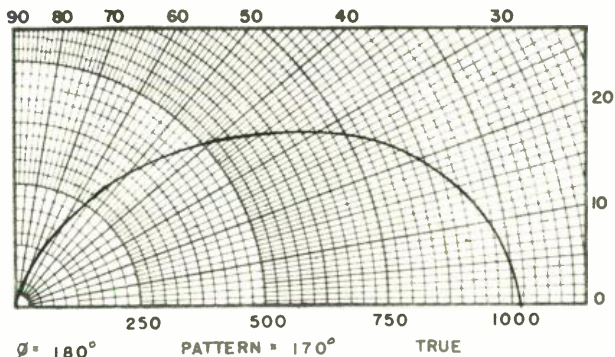
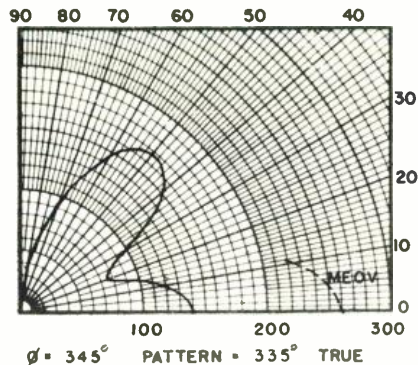
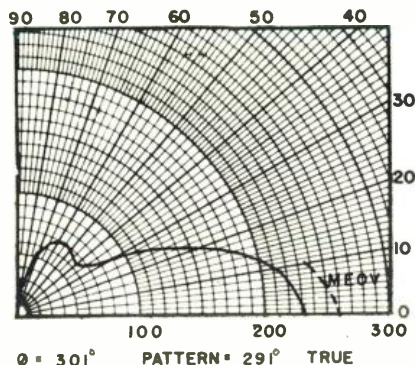
700 mv/m for 10 kw

221 mv/m for 1 kw

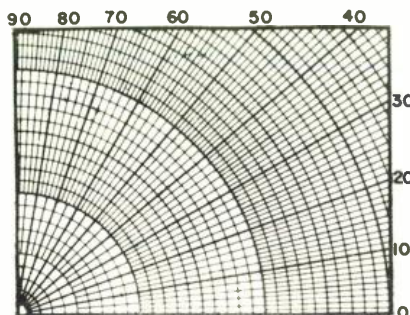
M. Location of Site:North Latitude $18^\circ 25' 25''$ West Longitude $66^\circ 8' 22''$



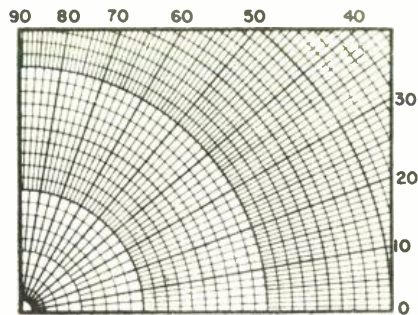
VERTICAL RADIATION PATTERNS



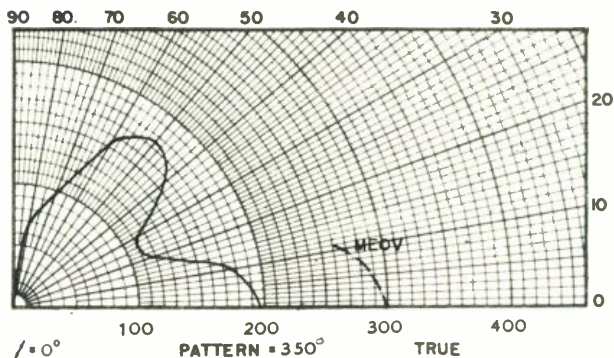
VERTICAL RADIATION PATTERNS



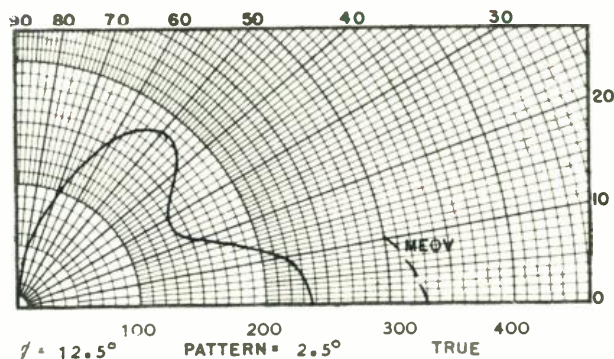
0° PATTERN = TRUE



0° PATTERN = TRUE



$\phi = 0^\circ$ PATTERN = 350° TRUE



$\phi = 12.5^\circ$ PATTERN = 2.5° TRUE



Topography by H. G. Warner, C. W. Nottage,
and L. T. Jorden
Surveyed in 1939

Legend

Symbol	Description
—	Highway
- - -	Other roads
—	Stream
—	Drainage
—	Contour
—	Spot elevation
—	Spot elevation
—	Spot elevation

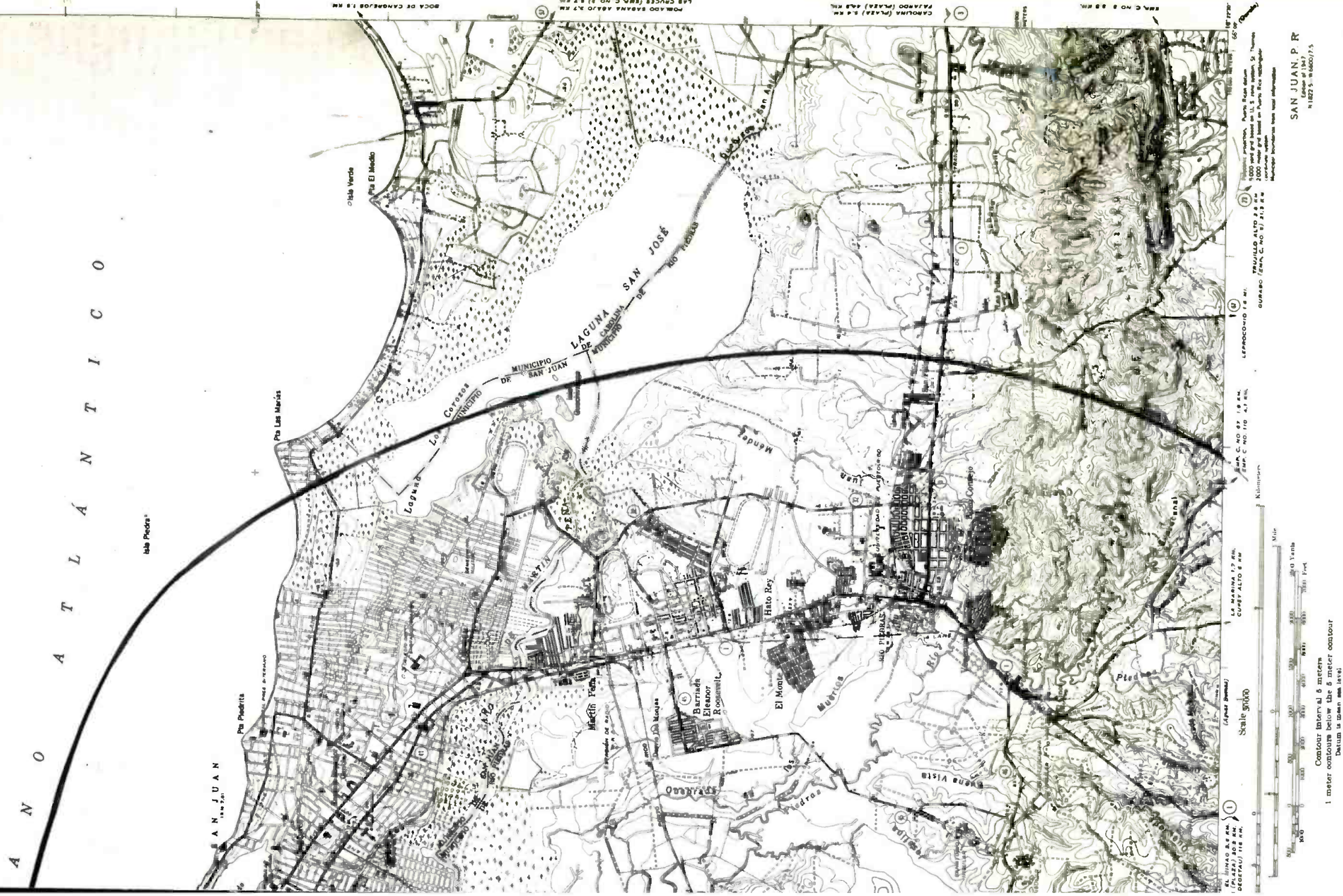
Note: The spot elevations are in feet above sea level.

Scale 1:25,000

Contour interval 5 meters
1 meter contours below the 5 meter contour
Datum is mean sea level

SANTURCE, PUERTO RICO
10 KW DA-1 740 KC

GLENN D. GILLET & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON 4, D. C.



A T L A N T I C O C E A N

C A R I B B E A N S E A

WIBS

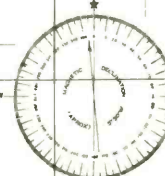
SANTURCE, PUERTO RICO

10 KW DA-1 740 KC

LOCATION OF CONTOURS
GLENN D. GILLET & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON 4, D.C.

WIBS

25 mvm

5 mvm
4.1 mvm2.5 mvm
2 mvm

LEGEND

- Primary Roads Surfaced
- Secondary Roads Surfaced
- Tertiary Roads Unsurfaced
- Trails
- Road Numbers
- Kilometer Markers
- Road Mileage
- Cities over 50,000
- City District Seats
- Towns
- Villages
- Sugar Cane
- Municipal Boundaries
- Navigation Markers

Note: Accumulated mileage between cities shown in red. Sectional mileage between towns and road junctions shown in blue.

ROAD MAP

ISLAND OF PUERTO RICO

N1748-W6529/48x148

TEN THOUSAND YARD WORLD POLYCONIC GRID, BAND VN, ZONE J
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

Scale 1:300,000

Basic control from Department of Interior Ins. Govt.
Island of Puerto Rico
Corrections & detail from PR Aerial Survey quads.
USGS field sheets & military reconnaissance reports
Compiled & printed by: Office of the Department
Engineer, P.R.D., San Juan. Edition of 1961

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BASIS FOR LOCATION OF CONTOURS

The location of the pertinent contours was determined from Appendix 1, Graph 7 of the Standards of Good Engineering Practice using the conductivities determined by the WIBS Proof of Performance at its present site (on file with the Federal Communications Commission) and the antenna radiation Appendix 3 of this exhibit. The conductivity was found to vary from 20×10^{-14} along the coast to 3×10^{-14} across the mountains. The FCC Figure 3 does not include Puerto Rico.

The effective antenna fields in various directions were computed in accordance with standard practice.

Interference fields were computed in accordance with the Standards of Good Engineering Practice (Appendix 12, Exhibit 1).

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AREAS AND POPULATION

Paragraph 11, Section V-A, FCC Form 301

(a) Number of persons residing within the following contours:

	<u>500 mv/m</u>	<u>250 mv/m</u>	<u>25 mv/m</u>	<u>5 mv/m</u>	<u>2 mv/m</u>
<u>Existing</u>					
Night	1520	6500	552,500	1,248,000	1,629,300
Day	1520	6500	552,500	1,248,000	1,629,300
<u>Proposed</u>					
Night	859	20,196	410,200	1,058,000	1,490,000
Day	859	20,196	410,200	1,058,000	1,490,000

(b) Area and population within the normally protected contours:

	<u>Contours (mv/m)</u>	<u>Area (sq. mi.)</u>	<u>Persons</u>
<u>Existing</u>			
Night	2.5	2800	1,557,300
Day	0.5	3355	1,787,700
<u>Proposed</u>			
Night	2.5	2410	1,338,000
Day	0.5	3355	1,787,700

(c) Area and population within the interference-free contours:

	<u>Contours (mv/m)</u>	<u>Area (sq. mi.)</u>	<u>Persons</u>
<u>Existing</u>			
Night	4.1	2060	1,210,000
Day	0.5	3355	1,787,700
<u>Proposed</u>			
Night	4.1	1968	1,180,000
Day	0.5	3355	1,787,700

(d) Area and population within the normally protected and interference-free contours of other stations to which objectionable interference may be caused by operation as proposed:

	<u>Contours (mv/m)</u>	<u>Area (sq. mi.)</u>	<u>Persons</u>
Night	not applicable		
Day	not applicable		

WIBS

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(e) Area and population within the resulting interference-free contours of the stations in (d):

	<u>Contours (mv/m)</u>	<u>Area (sq. mi.)</u>	<u>Persons</u>
Night	not applicable		
Day	not applicable		

Population of city of San Juan 169,247

Population of San Juan Senatorial District 397,730

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BASIS FOR AREA AND POPULATION
Required by Paragraph 12, Section V-A, FCC Form 301

The area of each contour was obtained by means of a planimeter.

The population within each contour except the blanket contours was determined by drawing the contour on a U.S. 1940 Census Minor Civil Division map and enumerating the divisions included. Where a contour cut a minor civil division the population was assumed to be distributed uniformly unless a town was shown in which case the remainder of the population was assumed to be distributed evenly. All towns or cities having a population in excess of the values given in Table II of Section I of the Standards of Good Engineering Practice were excluded.

The population within the 500 and 250 mv/m contours was determined by plotting the contours on a large scale county map, counting houses within these contours and multiplying by 3.7.

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HORIZONTAL RADIATION DATA

E MV/M			E MV/M		
<u>Ø PATTERN</u>	<u>Ø TRUE</u>	<u>NIGHT & DAY</u>	<u>Ø PATTERN</u>	<u>Ø TRUE</u>	<u>NIGHT & DAY</u>
0	350	196	190	180	1022
10	0	231	200	190	1026
20	10	259	210	200	1050
30	20	287	220	210	1064
40	30	329	230	220	1064
50	40	385	240	230	1036
60	50	448	250	240	980
70	60	490	260	250	868
80	70	525	270	260	721
90	80	553	280	270	553
100	90	581	290	280	392
110	100	644	300	290	252
120	110	728	310	300	147
130	120	826	320	310	98
140	130	903	330	320	91
150	140	959	340	330	119
160	150	994	350	340	161
170	160	1008			
180	170	1015			

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VERTICAL PLANE RADIATION DATA

	Station	C. L.				CMCD	CBL
	g True	350	2.5	170	215	291	335
	g Pattern	0	12.5	180	225	301	345
ELEVATION ANGLE θ	0	196	238	1015	1060	231	140
	10	175	217	973	1022	210	119
	20	119	154	868	896	154	77
	30	112	140	707	721	91	98
	40	154	168	525	518	64	154
	50	175	182	350	336	69	168
	60	154	154	196	182	69	147
	70	98	98	84	70	52	91
	80	63	35	0	0	18	36

	KACE 5 kw	KCBS 5 kw	KRMG 10 kw	KTRH 50 kw	WIBS 10 kw	WORZ 1 kw	CBL	CMCD
Angle	2180	3630	2190	2000		1200	1910	1120
Angle	111.8	90	114	107.2		123.5	--	1045
azimuth	0	0	0	0		2	0	2
at VL	350	320	610	300		272	1768	765
E	350	320	610	300		272	1768	765
	084	084	104			375	118	465
	< 5	< 5	.51	< 5		1.04	2.09	3.56

L Miles

2 Horizontal Angle

3 Vertical Axis

A Radiation - C-1

501-4-1111

C. Radiation at

20

Frequency 740 kc *
Power 10 kw
Time of Operation U
DA (1)
Non-DN Antenna 1
MU/M/KW Day _____
MU/M/KW Night _____
(These pp Ed Extra)

WILLIAMS

RSS interference with WTBS = 4.15 mv/m

[illegible]

	KACE	KCBG	KTRH	WIBS	WORZ	CBL	CMCD	
1 Miles	2180	3630	2190	2000		1200	1910	1120
2 Horizontal Angle	303	305	310	299		309	337	291
3 Vertical Angle	0	0	0	0		2	0	2
4 Radiation on Gnd	225	220	218	235		220	260	260
5 Radiation at VL	.084	--	.084	.104		.375	.118	.465
6. 20 x E	<.5	<.5	<.5	<.5		.83	<.5	1.21
7 Limit								

EXISTING PATTERN 470325

REMARKS

Frequency	740 kc	CALL	WIBS
Power	10 kw	Santurce,	
Time of Operation	U	68° 49' 15"	Puerto Rico
DA	(1)	66° 08' 22"	
Non-DA Antenna		File No.	
M/M/M/W Day		Date Amended	
M/M/M/W Night		EXIST	
(Theor. XXXXXXXXXX)			

	KACE	KCBG	KTRH	WIBS	WORZ	CBL	CMCD	
1	2180	3630	2190	2000		1200	1910	1120
2	303	305	310	299		309	337	291
3	0	0	0	0		2	0	2
4	225	225	225	235		225	260	260
5	.084	--	.084	.104		.375	.118	.465
6	<.5	<.5	<.5	<.5		0.85	<.5	1.21
7								

PROPOSED PATTERN 500425

GLENN D. GILLET & ASSOCIATES
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